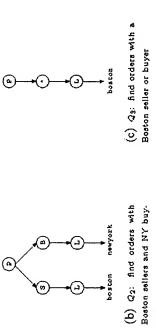
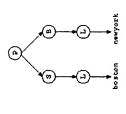
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					٠	
$\langle { t purchase*}  angle  angle$	(seller, buyer))	ID ID location CDATA name CDATA	(item*)	ID ID location CDATA name CDATA	$\langle \mathtt{item*} \rangle \rangle$	name CDATA manufacturer CDATA)
(!ELEMENT purchases	purchase	seller	seller	buyer	item	item
(!ELEMENT	(!ELEMENT purchase	(!ATTRIST seller	(!ELEMENT seller	(!ATTRIST buyer	(!ELEMENT item	(!ATTRIST item

# Figure 1 (Prior Art)

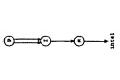
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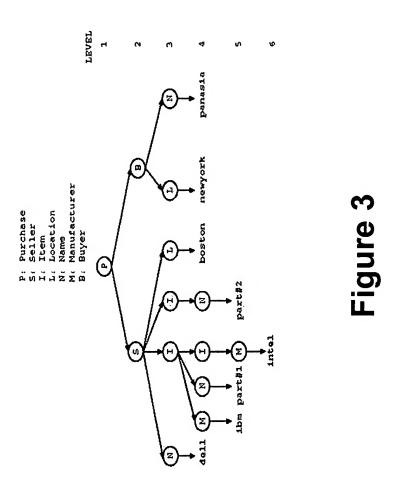
(a) Q1: find all manufacturers that supply Items

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(d) Q4: find orders that contain Intel products (Items or subitems)

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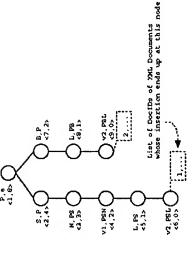


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$$\begin{split} \mathcal{D} = \\ & \underline{(P, \epsilon)}, \underline{(S, P)}, (N, PS), (v_1, PSN), (I, PS), (M, PSI), \\ & (v_2, PSIM), (N, PSI), (v_3, PSIN), (I, PSI), (M, PSII), \\ & (v_4, PSIIM), (I, PS), (N, PSI), (v_5, PSIN), \underline{(L, PS)}, \\ & \underline{(v_6, PSL)}, \underline{(B, P)}, \underline{(L, PB)}, \underline{(v_7, PBL)}, (N, PB), (v_8, PBN) \end{split}$$

# Figure 4

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 $Doc_1$ :  $(P,\epsilon)(S,P)(N,PS)(v_1,PSN)(L,PS)(v_2,PSL)$ 

 $Doc_2 : (P, \epsilon)(B, P)(L, PB)(v_2, PBL)$ 

 $Q_1 : (P,\epsilon)(B,P)(L,PB)(v_2,PBL)$ 

 $Q_2 : (P, \epsilon)(L, P*)(v_2, P*L)$ 

(b) A tree structure for Doc1 and Doc2

(a) XML does and queries in structure-encoded sequences

Figure 5

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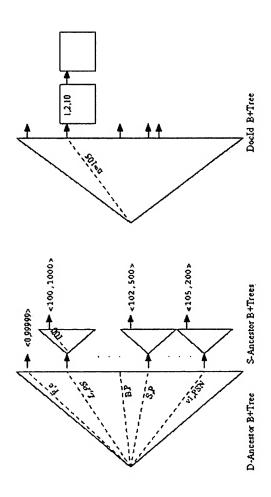
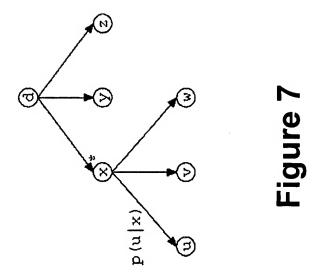


Figure 6

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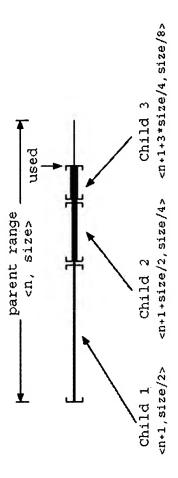


Figure 8

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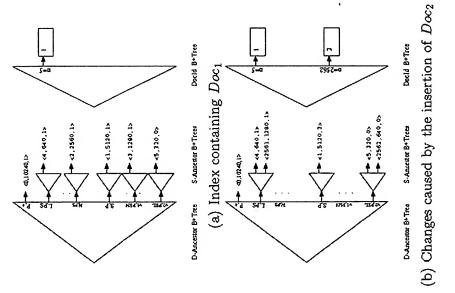


Figure 9